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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/778,071 | 02/07/2001 | Takashi Takeuchi | 202937US2S | 7369 |
| 22850 | 7590 | 07/27/2004 | | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER | |
| | | | RAMANA, ANURADHA | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3732 | |

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/778,071 | TAKEUCHI ET AL. |
| | Examiner | Art Unit |
| | Anu Ramana | 3732 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 09 April 2004.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.
 4a) Of the above claim(s) 4-7 and 10 is/are withdrawn from consideration.
 5) Claim(s) 11 is/are allowed.
 6) Claim(s) 1-3, 8, 12 and 13 is/are rejected.
 7) Claim(s) 9 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment/Arguments

Applicants' amendments to claims 8, 9 and 11 in the response filed on April 9, 2004 have overcome the rejections made under 35 USC 112, paragraph 2 in the office action mailed on October 9, 2003. Applicants' arguments submitted under "REMARKS" in the response filed on April 9, 2004, with respect to claims 1-2, 8 and 12-13 have been considered but are moot in view of the new ground(s) of rejection made in this office action.

Claim Objections

Claims 3, 12 and 13 are objected to because of the following informalities.

It appears that the units of impedance are incorrect since impedance is generally measured in MRayls (1.0 Rayl = 1.0 Kg/m²s). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Saitoh et al. (US 5,295,487 or '487 herein).

'487 discloses an array-type ultrasonic probe having a plurality of piezoelectric members 11 wherein each piezoelectric element is constructed of a single crystal piezoelectric, for e.g. lead titanate; a lower or "first" electrode 14; a backing member 12; and a flexible printed wiring board 17 having a plurality of pattern wires arranged between electrode 14 and the backing member 12 wherein each pattern wire extends in a longitudinal direction of each piezoelectric element and has a width smaller than the width of each piezoelectric element (Figure 2, col. 8, lines 43-59 and col. 9, lines 22-56).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barthe et al. (US 6,049,159 or '159 herein) in view of Tezuka (US 6,308,389 or '389 herein).

'159 discloses an ultrasonic element having a single-crystal array-like 2-2 composite piezoelectric member 110 having electrical connection or "electrode" layers 116A and 116B, formed on the upper and lower surfaces, respectively, of member 110 wherein layers 116A and 116B are formed of a suitable conductive material (col. 2, lines 63-67, col. 3, lines 1-67 and col. 4, lines 1-64).

'159 further discloses that frontal matching layer 114 can be combined with electrode layer 116B by forming matching layer 114 of a conductive material to minimize impedance mismatch at the boundaries between 110 and the respective layer (col. 4, lines 1-23 and lines 37-64).

'159 does not disclose that the conductive material is a conductive resin.

'389 teaches an acoustic matching layer made of a conductive resin (epoxy filled with a silver frit) (col. 6, lines 60-64).

Accordingly it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made matching layer 114 of a conductive resin since it was known in the art that a matching layer could be made of a conductive resin for electrical connectivity to an electrode.

Regarding claims 3, 12 and 13, '159 discloses the claimed invention except for the claimed range of acoustic impedances. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided an upper or lower resin layer with an impedance in a range of 2×10^6 Kg/m² sec to 10×10^6 Kg/m²s to minimize impedance mismatch, since it has been held that where the general conditions of a claim are disclosed in the

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prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

The indicated allowability of claim 3 is withdrawn in view of the rejections made in this Office Action. The Examiner apologizes for any inconvenience caused to the Applicants due to this change.

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 11 is allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anu Ramana whose telephone number is (703) 306-4035. The examiner can normally be reached Monday through Friday between 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Shaver can be reached at (703) 308-2582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AR
July 22, 2004

Todd E. Manahan
Primary Examiner